EMSP
Environmental Management Science Program

FACTS ON FILE

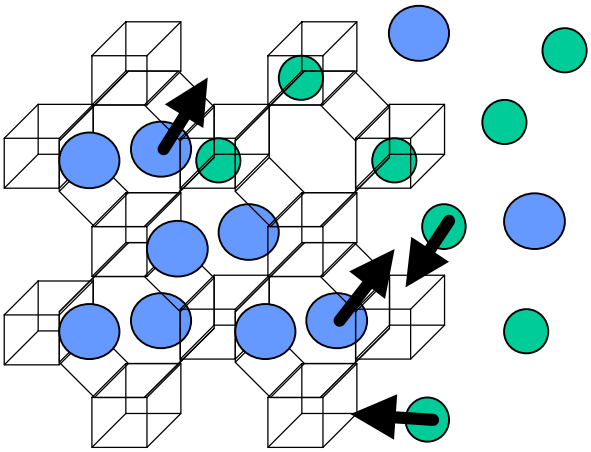
Development of Inorganic Ion Exchangers for Nuclear Waste Remediation

Problem Area: High Level Waste
Scientific Category/Subcategory: Separations Chemistry/Ligand Design and Ion Exchange

Description: Researchers at Texas A&M University and Oak Ridge National Laboratory are exploring highly selective inorganic ion exchanger materials for removal of primarily cesium and strontium from nuclear tank waste and from ground water. They are undertaking detailed structural studies on a variety of materials including cavity, layered and amorphous gel structures to elucidate the thermodynamic, kinetic, and molecular basis for ion exchange.

Application: These studies are most applicable to the Tanks Focus Area, but also potentially to the Mixed Waste and Subsurface Contaminants Focus Areas, since it can lead to improved selectivity ion exchange materials for a host of contaminants. Improved ion exchangers can directly benefit separations efforts on high level waste at Richland, Savannah River, and Idaho to separate out the most radioactive constituents for vitrification.

Value/Benefits: Through better understanding the mechanisms and drivers of ion exchange processes, better ion exchange materials can be custom designed and engineered to function in complex ionic media for which current ion exchangers are not efficient or cost effective. Improved ion exchange selectivity can reduce the cost and complexity of separations processes, and thereby reduce the inherent risk to workers.



Project Lead:
Texas A&M University
Dr. Abraham Clearfield
(409) 845-2936 *pjf2434@acxrd.chem.tamu.edu*
Other Participating Institutions:
Oak Ridge National Laboratory
Dr. Zane Egan (423) 576-6068
Project Duration:
1996-1999
Web Information Sources:
http://www.doe.gov/html/em52/54735.html

The Environmental Management Science Program (EMSP) is funding basic research projects focused on solving the most difficult problems that threaten the closure plans of DOE sites. Further program information can be found at this web site: *http://emsp.em.doe.gov*